

Working Capital Management and the Performance of Consumer and Industrial Goods Sectors in Nigeria

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Abstract

The paper investigates the impact of working capital management on the performance of selected companies listed on the Nigerian Stock Exchange using panel data for forty (40) firms from the consumer and industrial goods sectors of the economy from 2006-2015. Return on assets (ROA) was adopted as proxy for firm performance while cash conversion cycle (CCC), average payment period (APP), inventory conversion period (ICP), and average collection period (ACP) were adopted as proxies for working capital management. Estimation of the impact of the exogenous variables (cash conversion cycle, average payment period, inventory conversion period and average conversion period) on firm performance (endogenous variable) was based on the econometric techniques of the Ordinary Least Squares (OLS) and Generalized Least Square (GLS). Based on the OLS technique, the adjusted R^2 shows that 54% of variations in ROA were explained by the exogenous variables while the GLS shows that 62% of the variations were explained by the exogenous variables. These results imply that the exogenous variables significantly explain firm performance in selected sectors. The regression results show evidence of significant positive impact of average payment period and inventory conversion period on firm performance. There is also evidence of non-significant negative impact of cash conversion cycle on the performance of the selected firms. Parameter estimates were obtained at 5 per cent level of significance. Based on the above result, the study concludes that working capital management has significant impact on the performance of firms in the consumer and industrial goods sectors of the Nigerian economy. Industry managers are therefore advised to

devise efficient strategies for managing working capital so as to optimize its potentials.

Keywords: Firm performance, Working capital management, Exogenous variable, Endogenous variable.

1.0: Introduction

Effective management of working capital presents a crucial and challenging financing decision that firms have to make in their day-to-day management of operations. It involves taking strategic decision in managing the connection between the short-term liabilities and assets of a firm to ensure smooth and efficient operations. It can simply be explained as the act of managing investment/divestment in short-term receivables as well as managing the increase/decrease in short-term payables. Working capital management is said to be efficient if an organization is able to finance daily operational expenses and meet other short-term obligations at lesser costs (Angahar & Alematu, 2014). Barine (2012) opines that effective management of both short-term payables and receivables combined with long term assets is required to meet daily business operational activities. Both short term receivables and payables are the main elements of working capital. Corporate performance depends largely on the effectiveness of strategies adopted in managing working capital in an organization because of its importance to the sustenance of its daily operations.

The importance of working capital management to the realization of organizational objective is evident in literature. Horne and Wachowitz (2000) opine that efficient working capital management is crucial for consumer and industrial goods companies because most of their assets and liabilities are in the form of short term receivables and payables. Kargar and Bluementhal (1994) reveal that maintaining an optimal balance between profitability and liquidity should be accorded high priority in planning the working capital structure of firms so as to reduce the likelihood of bankruptcy and corporate failure. Raheman and Nasr (2007) opine that firms are in business to make profit while ensuring that liquidity is at the optimum level. Maintenance of optimal balance between profitability and liquidity is therefore a crucial factor in determining working capital mix or structure for a firm. Since an optimal mix of working capital elements enhances firm performance, it follows therefore that effective working capital management ensures that shareholders get value for their investment.

The choice of the sectors selected for this study derives from their size relative to the Nigeria's GDP. For instance, while the consumer goods sector is the second largest sector in Nigeria, the industrial goods sector is the fourth (NSE Factbook, 2014). There are thirty two (32) companies under consumer goods sector while the industrial sector has 25 firms listed on the NSE as at 2015 (NSE Fact book, 2015). Both sectors play very active roles in the Nigerian stock market and contribute significantly to the nation's export. Also, both sectors contribute about 21% to Nigeria's gross domestic product (GDP). Due to the importance of both sectors to the growth of the Nigerian economy, there is need for their operations to be examined more closely both at the firm and industry levels. Working capital

management practice in these sectors was chosen as the focus of this study due, largely, to its critical role in organizational performance.

Our study contributes to prior literature on the subject area, especially in Nigeria, by extending its scope. Earlier studies on the subject area have largely focused on manufacturing (Akindele & Odusina, 2015; Angahar & Alematu, 2014; Emeni & Uruakpa, 2013; Barine, 2012). In terms of scope also, this study incorporates an extended time frame for robustness. Specifically, the study investigates the extent to which working capital management has impacted on the performance of both consumer and industrial goods sectors in Nigeria over the period 2006 to 2015.

1.1: Hypotheses Development

Cash conversion cycle: Cash conversion cycle (CCC) is an indicator for measuring the effectiveness of a company's management and by extension the overall health of the company. Elizalde (2003) opines that cash conversion cycle is an important component of working capital management because firms need funds to operate in a competitive environment. Effective management of cash conversion cycle, therefore, is crucial for the survival of an organization. Cash conversion management is an essential financial indicator of corporate health and performance. Dong and Su (2010) assert that the overall measure of working capital management efficiency is linked to efficient cash conversion cycle management. This study therefore predicts thus:

H₀₁: Cash Conversion Cycle (CCC) has no significant positive effect on firm performance.

Average payment period: The period it takes an organization to pay off outstanding bills or suppliers' invoices outstanding to their credit is known as average payment period (APP). The longer it is the more funds an organization has to support daily operations. Pandey (2005) posits that APP is a major source of funds for financing working capital for most organizations. Effective management of APP can therefore boost firm performance. Therefore, this paper predicts that:

H₀₂: Average Payment Period (APP) does not have significant positive impact on firm performance.

Inventory conversion period: The average period it takes an organization to realize cash invested in inventory is referred to as inventory conversion period. It is also explained as the period taken to procure raw materials, process them and then sell off the finished products. Pandey (2005) views proper management of inventory as a major component of working capital structure in any organization. Filbeck, Kruege and Preece (2007) opine that an optimal inventory conversion period will reduce excessive or inadequate inventories. Maintenance of optimal inventory levels ensures efficient utilization of capital and hence promotes firm performance. This paper therefore hypothesizes that:

H₀₃: Inventory Conversion Period (ICP) does not have significant positive impact on firm performance.

Average collection period: The time a credit sale is made and the time cash is received from the buyer or debtor is known as average collection period. Refuse (1996) explains average collection period (ACP) as the period which a firm allows credit to be enjoyed by customers for the services rendered. A good credit policy seeks to reduce the time between the completion of sales and receipt of payments. Srivastarva (2004) posits that real profit can be generated after receivables are turned into cash. This study thus predicts that:

H₀4: Average Collection Period (ACP) has no significant positive effect on firm performance.

2.0 Literature Review

2.1 Concept of Working Capital

Working capital is an integral part of organizational performance, hence the importance often attached to its management. Effective working capital management ensures maintenance of optimal levels of working capital at any point in time. An optimum level of working capital is that level which supports daily operations without compromising efficiency. It does not expose the firm to losses associated with excess or inadequate working capital. Adequacy of working capital enhances operational performance of a firm thereby ensuring its continued existence while its inadequacy works in reverse. Akinsulire (2005) opines that working capital contains important items like inventories, receivables, payables and cash that are needed for an organization's daily operations. Padachi (2006) views working capital management as the availability of ready funds essential for the daily operational activities of an organization. Afza and Nazir (2009) posit that optimal use of working capital components is an essential aspect of the overall corporate strategy of an organization aimed at creating shareholders wealth. Raheman and Nasr (2007) also explain working capital management as the efficient combination of trade receivables and payables necessary to maximize profit for the organization.

Mathuva (2010) outlined the crucial aspects or components of working capital management to include management of trade receivables and payables, holding investible funds/cash and maintaining a certain level of inventories. He maintains that optimization of these working capital components determine to a large extent the performance of an organization.

Organizational performance, for the purpose of this study, is synonymous with corporate profitability, firm performance or financial performance. Dong and Su (2010) argue that financial performance is the main objective of a corporate organization. It is measured as returns generated on the capital invested in the business.

2.2: Review of Empirical Literature

Lazaridis and Tryfonidis (2004) examined the effect of working capital management on the profit performance of one hundred and thirty one(131) Turkish companies listed on the Athens Stock Exchange. Data on the research variables covered the period 2001 to 2004. Working capital management was proxied by average payment period, average receivables and inventories as the explanatory variables while the

proxy for profitability was gross operating profit. They find positive effect of the explanatory variables on profitability. Pearson's correlation and Ordinary Least Squares regression models were used in the study.

Falope and Ajilore (2009) examined the impact of working capital management on corporate profitability of non-financial service companies quoted on the Nigerian Stock Exchange (NSE). The study examined fifty companies using data over the period 1996-2005. The study found a negative relationship between net operating profit (dependent variable) and the independent variables (average payment period, cash conversion cycle, average collection period and inventory turnover). The result also shows that firm size does not affect the financial performance. Pooled ordinary least squares method was used to estimate the relationship between the measures of working capital management and corporate profitability.

Mathuva (2010) examined the impact of working capital management on corporate profitability of firms in Kenya. The study analysed a sample of 30 firms quoted on the Nairobi Stock Exchange for the periods 1993-2008 using the ordinary least square (OLS) estimation technique. He finds a negative impact of working capital management on firm performance. The study further shows a significant positive impact of average payment period on the performance of Kenyan firms. Sarbapriya (2011) studied the effect of working capital management on the profit performance of Indian manufacturing firms using a sample of three hundred and eleven firms. The study covered a period of 14-years. He finds evidence of significant positive impact of working capital management on the profitability of Indian manufacturing firms. Pearson and Spearman's correlations, the pooled ordinary least squares and the fixed effects regression models were adopted for the study.

Alipour (2011) analysed the impact of working capital management on the corporate profitability of Iranian firms. The study investigated 1063 firms listed on the Tehran Stock Exchange for the period 2001-2006. The study shows that working capital management in Iran has significant negative impact on corporate profitability. The study suggests a reduction in receivables accounts and inventory order among Iranian firms. The researcher employed the techniques of multiple regression and Pearson's correlation methods.

Kulkanya (2012) examined the effect of working capital management on firm performance for companies listed on Thailand Stock Exchange using a sample size of 225 companies from 2007-2009. The study presents evidence of negative impact of receivable collection and inventory conversion periods on gross operating profit. The method of data analysis was regression analysis based on a panel sample of 255 companies listed on the Stock Exchange of Thailand from 2007 through 2009.

Walter, Washington, Dingilizwe and Runesu (2014) sought to ascertain the extent to which the profitability of listed non-financial services companies in Zimbabwe is affected by management of working capital. The study used a panel data for the period 2009-2013. They found positive relationship between firm performance and debtor's collection period. The study also shows significant negative effect of debt to asset ratio and firm value on profitability. The study used regression analysis method based on a panel sample of 39 non-financial firms listed on the ZSE from 2009 to 2013.

Angahar and Alematu (2014) studied the effect of working capital on the profit performance of the Nigerian cement sub-sector. The study investigated four (4) cement companies quoted on the Nigerian Stock Exchange for the period of 8 years, from 2002-2009. The study shows non-significant negative effect of number of days account receivable are outstanding on firm profitability. It also reveals a significant positive effect of cash conversion cycle on the profit performance of the selected firms. Descriptive statistics and multiple regression analysis were used analysing the data.

Makori and Jagongo (2013) examined the effect of working capital management on the profitability of selected firms from the manufacturing and industrial goods sectors in Kenya over the period 2003-2012. The result shows negative impact of number of days account receivable are outstanding and cash conversion cycle on corporate profitability. There is also evidence of positive impact of number of days' inventory and accounts payable on profitability. Pearson's correlation and Ordinary Least Squares regression techniques were used to establish the relationship between working capital management and firm's profitability.

3.0: Research Methodology

This study is based on non-survey research design and the study data were collected from annual reports and accounts of the sampled firms for the period of the study (2006-2015). The population under study relates to all companies in the consumer and industrial goods sectors listed by NSE as at 31st December, 2015. The selected sample size consists of 40 companies from the population, derived from Taro Yamane formula. Ordinary least square (OLS) and Generalized least square (GLS) regression methods, Pearson correlation and descriptive statistics were used to analyze the data using SPSS statistical software.

3.1: Variable Measurement

Independent variables: Working capital management was adopted as the independent variable. However, average payment period (APP), cash conversion cycle (CCC), inventory conversion period (ICP) and average collection period (ACP) were adopted as proxies used to measure working capital management.

Dependent variable: The study adopted corporate performance as the dependent variable. Return on assets (ROA) was employed as proxy for firm or corporate performance.

Control variables: These are variables whose effects need to be neutralized in order to limit their influence on the dependent variable. They include (i) sales growth denoted as GROWTH (ii) debt ratio denoted as LEV (iii) total assets denoted as SIZE (iv) current ratio denoted as CR.

Measurement of the research variables as used by Makori and Jagongo (2013) is presented in table 1 below:

Table 1: Measurement of Variables

Variable	Abbreviation	Measurement
Cash Conversion Cycle	CCC	ACP+ICP-APP
Average Payment Period	APP	Average Payment/Cost of goods Sold*365
Inventory Conversion Period	ICP	Inventory/Cost of goods Sold*365
Average Collection Period	ACP	Average Receivables/Net Sales*365
Return on Assets	ROA	Earnings /Total Assets
Firm Size	SIZE	Log(Total Assets)
Sales Growth	GROWTH	(Sales _t – Sales _{t-1}) / Sales _{t-1}
Leverage	LEV	Total Liabilities/Total Assets
Current Ratio	CR	Current Assets/Current Liabilities

3.2: Model Specification

The study adopts the model in Makori and Jagongo (2013) which was used to estimate the effect of working capital management on corporate profitability in Kenya.

$$ROA_{it} = \beta_0 + \beta_1 CCC_{it} + \beta_2 APP_{it} + \beta_3 ICP_{it} + \beta_4 ACP_{it} + \beta_5 SIZE_{it} + \beta_6 GROWTH_{it}$$

$$+ \beta_7 LEV_{it} + \beta_8 CR_{it} + \varepsilon_{it} \dots \dots \dots (1)$$

Where:

ROA = Return on Assets

CCC = Cash Conversion Cycle

APP = Average Payment Period

ICP = Inventory Conversion Period

ACP = Average Collection Period

SIZE = Firm Size

GROWTH = Sales Growth

LEV = Leverage

CR = Current Ratio

β_0, \dots, β_6 = Parameters to be estimated

ε_{it} = Error term

4.0: Results and Discussion

This section presents and interprets the regression result obtained from the OLS and GLS estimations. It starts with preliminary test of the data using descriptive statistics and correlation followed by a regression results.

Table 2: Summary of Descriptive Statistics

Variable	Mean	Median	SD	Min.	Max.
ROA	0.175	0.147	0.129	0.025	0.412
CCC	51.442	47.123	50.002	21.254	195.421
APP	91.421	84.213	47.237	16.792	232.495
ICP	85.412	76.419	42.902	25.291	201.247
ACP	51.516	49.020	29.274	7.472	156.792
SIZE	17.274	16.847	1.920	10.724	15.824
GROWTH	0.172	0.152	0.122	0.541	0.844
LEV	0.452	0.574	0.314	0.216	0.869
CR	2.742	1.920	2.838	0.942	15.721

Source: 2006-2015 Survey Data, SPSS Output & E-View

From the above table, return on assets (ROA) has a mean value of 17.5% with a standard deviation of 12.9%. The table also shows that cash conversion cycle (CCC) has a mean of 51.442 days with a standard deviation of 47.125 days. The mean value of average payment period (APP) is 91.421 days with a standard deviation of 47.237 days. The table also shows that it takes 85.42 days, on the average to convert inventories into sales with a standard deviation of 42.902 days. The mean value for average collection period (ACP) is 51.516 days. The implication of ACP (51.516 days) being lower than the APP (91.421 days) is enhanced liquidity since firms take shorter period to collect outstanding payments than they have to pay outstanding debts. Also, the minimum and maximum values for all the explanatory variables and the endogenous variable show wide ranges. For instance, ROA fluctuates between 0.025 and 0.412. CCC fluctuates between 21.254 and 195.421 while APP fluctuates between 16.792 and 232.495. ICP varies from 25.291 to 201.247, while ACP varies from 7.472 to 156.792. For the control variables, GROWTH and LEV show a good measure of convergence while SIZE and CR reflect the opposite.

TABLE 3: Pearson Correlation

	ROA	CCC	APP	ICP	ACP	SIZE	GROWTH	LEV	CR
ROA	1								
CCC	-0.289**	1							
APP	0.498**	0.240	1						
ICP	0.275**	-0.249*	0.486**	1					
ACP	-0.514	0.155**	0.385**	-0.398*	1				
SIZE	0.287**	-0.472	0.077**	-0.558**	0.763**	1			
GROWTH	0.145	0.157	0.241	0.246	-0.018	0.43*	1		

LEV	-0.474**	0.698	-0.335*	-0.497**	-0.075	0.233	-0.421**	1	
CR	0.174	0.187	-0.001	0.389*	-0.471**	-0.299*	0.148	-0.477	1

2006-2015 Survey Data, SPSS Output & E-View

The Pearson correlation matrix presented in table 3 shows the relationship between (ROA) and each of the explanatory variables included in the study (CCC, APP, ICP, ACP, FIRM SIZE, GROWTH and CR). The relationship between ROA and CCC found to be weak and negative with correlation coefficient of -0.289. The negative relationship between ROA and CCC shows that there is shorter period between dispensing of cash (for instance, when raw materials were sourced) and realization of cash (the collection of sales of finished goods) thus making for increased profitability. The relationship between ROA and APP shows a positive correlation coefficient of 0.498. The positive relationship between ROA and APP implies that the later the firms pay off outstanding bills the better. Firms can therefore choose to settle their bills as late as possible and thereby employ the credit in other productive areas, earning more returns in the process. For the firm, this may seem an efficient management approach but the danger is that suppliers may react negatively, leading to inventory shortages, production stoppages and eventual decline in earning capacity.

The relationship between ROA and ICP shows a positive correlation coefficient of 0.275. The positive association between ICP and ROA is an indication of management efficiency because cash is not unproductively tied down at the procurement, production or sales stages. This result is consistent with the work of Blinder & Maccrni, 1991. The relationship between ROA and ACP indicates a negative correlation coefficient of -0.514. Observed negative association between ROA and ACP indicates that as debtors pay their obligations to the firm within shorter periods, return on assets is enhanced. The implication is that firms would have more cash available to run their operations and replenish inventory on time, thereby, leading to increase in sales which positively impacts profitability and hence performance.

The control variables (FIRM SIZE, GROWTH, and CR) are observed to have a positive relationship with ROA, with correlation coefficient values of 0.287, 0.145 and 0.474. However, only LEV shows a negative relationship with ROA with correlation coefficient value of -0.474

Regression Analysis

Table 4 shows the result of multicollinearity test conducted on the data to ascertain the degree to which any two explanatory variables change with respect to each other. A serious case of multi-collinearity makes it difficult to determine the individual effect of each explanatory variable on the dependent variable.

Table 4: Robustness Check

Variable	VIF	Tolerance
CCC	1.729	0.3891
APP	1.45	0.4115
ICP	1.301	0.6579
ACP	2.292	0.7246
SIZE	1.591	0.6289
GROWTH	1.742	0.9346
LEV	1.802	0.9457
CR	2.174	0.7124

Source: 2006-2015 Survey Data, SPSS Output

The essence of robustness test is to validate the authenticity of statistical inference and avoid making a wild guess. The result shows that VIF ranges from 1.092 to 2.292 which are far lower than the upper limit of 10. These indicate that the explanatory variables are not strongly correlated; hence there was no problem of multicollinearity (Gujarati & Songeetha, 2008 and Lind, Marchal & Wathen, 2010).

Table 5: Hausman Specification Test

Test of Cross-Section Random Effects		
Test Summary	Chi-Sq. Stat.	P-Value
Cross-Section random	41.4126	0.001

Source: Authors' Computation (2016) using STATA 10

The Hausman specification test helps to determine the choice between Fixed Effect Model (FEM) and Random Effect Model (REM) for a particular set of data. The decision rule under Hausman test is to accept the null hypothesis where the p-value is greater than the 0.05 Mackinnon value. If the null hypothesis must be rejected, then the fixed effect model is appropriate to use (Gujarati & Porter, 2009). Table 5 shows that the p-value (0.001) is less than 0.05 absolute Mackinnon value, therefore, FEM is the appropriate model to use in this study.

Table 6: Regression Result

Explanatory Variables	OLS			GLS		
	B	t-stat	p-value	β	t-stat	p-value
Constant	-1.002	0.021	0.871	-9.119	1.74	0.207
CCC	-0.114	0.076	0.401	-1.211	0.658	0.18
APP	0.142	0.057	0.02*	0.417	2.245	0.03*
ICP	0.245	2.245	0.01*	0.278	3.886	0.001*

ACP	0.322	1.995	0.03*	-0.472	0.361	0.34
FIRMSIZE	0.548	1.987	0.01*	0.124	3.124	0.02*
GROWTH	0.124	2.253	0.011*	0.321	2.095	0.03*
LEV	-0.775	0.759	0.399	-1.473	0.651	0.23
CR	0.029	1.954	0.06	0.166	0.398	0.04*
R ²	68%			71%		
Adj. R ²	54%			62%		
P-Value	0.002			0.001		
F-Value	0.001			0.000		
R ² : Within	0.7141			0.7984		
Between	0.5545			0.5901		
Overall	0.5412			0.6179		
		* significant at 5% respectively				

Source: 2006-2015 Survey Data, SPSS Output & E-View

Discussion

Table 6 presents the regression analysis using both Ordinary Least Square (OLS) and Generalized Least Square (GLS) techniques to determine the effect of the explanatory variables on the dependent variable. The OLS shows that APP, ICP, ACP, FIRM SIZE and GROWTH have significant positive effect on ROA at 5% level of significance. CCC and LEV show non-significant negative impact while CR has non-significant positive impact. The Adjusted R² indicates that 54% of the variations in the dependent variable are accounted for by the explanatory variables. The result suggests that the longer the APP the better for the firm as it is enabled to take advantage of available cash for its operations.

Table 6 also presents the regression result based on GLS estimation technique. The GLS result shows that APP, ICP, FIRM SIZE, GROWTH and CR are statistically significant at 5% level of significance. However, CCC, ACP and LEV are statistically insignificant at 5% level of significance. The Adjusted R² shows that 62% of variations in the dependent variable (ROA) are due to changes in the explanatory variables.

Further analysis of the regression result indicates a significant positive effect of APP on ROA. The result conforms to the OLS result and suggests that the longer the APP the better for the firm as it is enabled to take advantage of available cash for its operations. This result is, however, at variance with the prior work of Raheman & Nasr (2007) and Sharma & Kumar (2011). Their findings show a negative impact of APP on ROA. For both OLS and GLS the results show non-significant negative impact of CCC on ROA, an indication that a longer CCC negatively impacts firm performance. This result aligns with the study by Shen & Soenen (1998).

The regression results also show evidence of significant positive impact of ICP on ROA. This result implies that longer ICP raises ROA. Though contrary to *a priori* expectation, the result supports the finding in Garcia-Turuel & Martinez (2007) and Padachi (2006). The GLS result also shows a non-significant negative impact of ACP

on ROA. This is an indication that shorter ACP enhances return on earning assets while longer periods diminish returns, hence an evidence of lax working capital management. This finding is not consistent with the studies by Filbeck et al. (2005) and Gakure, Cheluget, Onyango and Keraro (2012).

5.0: Conclusion

Evidence emanating from the study shows that average payment period (APP) and inventory conversion period (ICP) have significant positive impact on return on assets (ROA). However, cash conversion cycle (CCC) shows a non-significant negative impact on return on assets. For the control variables (size, growth, leverage, current ratio), there is evidence of significant positive impact of FIRM SIZE and GROWTH on financial performance of firms selected for this study. Following from the results presented above, we conclude that working capital management has a significant impact on the performance of firms in the consumer and industrial goods sectors of the Nigerian economy. In view of the identified role of working capital in enhancing firm performance, industry managers are advised to innovate efficient ways of managing working capital to optimize its potentials. Efficient working capital management ensures maintenance of optimal levels of inventory at a point in time.

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